

Anatomy of a GrADS .ctl file

```
dset ./output.gds a
title results from simple model b
undef -99999 c
xdef d 21 linear 0 0.1 e
ydef 1 linear 1 1 f
zdef 1 linear 1 1 h
tdef g 1 linear 00Z01JAN2000 1mn i
vars 1 j
psi k 1 99 arbitrary variable l
endvars m
```

comments

- a. whatever your output file is called (and its location)
- b. whatever you want; the line needs to be here, but the description can be anything
- c. a value, specified in your code, that you are using to represent any undefined/missing values
- d. the number of points in the x-direction
- e. the first number is the starting point of the x-axis (i.e. what is x=1's location?)
the second number is the grid spacing; here I have specified it in terms of km
(by default GrADS "reads" it in terms of longitude, but there are ways around this)
- f. For our simple 1D example, the y-dimension is 1, as is the z-dimension. When you have more than one y or z point, that line will be set up in exactly the same way as the xdef line
- g. For now we only have one output time (the first time), but once we run the model forward, this first number will correspond to the number of times we wrote to our output file
- h. For real world data, this string is set to reflect the actual date and time at which the data start. For our idealized models, the starting time is basically irrelevant. So, this can then be set to whatever you like. It's easy to start at 00:00 on 1/1/00 (as shown here).
- i. This is the time interval between your output times (here, 1 minute). It's irrelevant when we only have one data time, but will be needed later on when we have more than one. See the GrADS manual for other possible units (hours, days, etc.). At this juncture, GrADS will not accept time intervals in terms of seconds, so when I need that, I "bogus" it by using minutes instead. In other words, if my output interval were 15 seconds, I would set this value to 15mn. It works fine since both seconds and minutes are "base sixty". Then, when I see 3:30, I just remember to interpret it as 3 min 30 sec (even though GrADS "sees" it as 3 h 30 min).
- j. The number of variables you are writing out. For now, we only have one, but eventually we will have more than that. The list of variables then follows.
- k. This number represents the number of levels on which the variable is represented. So, for now, it is set to 1. If we had 40 vertical levels, then this number would be 40. It is possible to have a combination of some variables that are defined on all levels and some that are defined only at the surface (i.e. accumulated precipitation), which is why the number of levels must be specified for each variable.
- l. "99" is a setting that doesn't need to be changed. In some situations, it can be used to include additional information about the variable, but we won't need it for our projects. GrADS will refer to this variable as "psi". The additional naming info (here, "arbitrary variable") can be whatever you want, and is just for your own reference.
- m. Once you have included a line (like the one for psi) for each of your variables (i.e. the total number in box j), the file always ends with "endvars".